

What is claimed is:

- 1 1. A capillary assisted loop thermosiphon apparatus comprising:  
2 at least one evaporator connected by a vapor line to a condenser; a liquid line connecting  
3 the condenser and the evaporator; the evaporator is in the direction of gravity from the condenser  
4 such that the condenser supplies liquid under gravity induced pressure to the evaporator, and the  
5 evaporator has a vertical capillary wick in which liquid wicks in the direction of gravity.
- 1 2. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 a heat conducting capillary wick extends vertically against a heat absorbing surface on  
3 the evaporator; and a vapor collection cavity extends vertically along the capillary wick, the  
4 vapor collection cavity being connected to the vapor line.
- 1 3. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 a liquid line irrigator connected to the liquid line supplies liquid under gravity induced  
3 pressure to a vertical heat conducting section of the capillary wick;  
4 the capillary wick extends in conducting engagement along at least one heat absorbing  
5 surface on the evaporator; and  
6 a vertical vapor collection cavity in the heat conducting section of the capillary wick  
7 extends vertically along the capillary wick, and the vapor collection cavity is connected to the  
8 vapor line.
- 1 4. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 a liquid line irrigator is connected to the liquid line, and the liquid line irrigator extends  
3 along a top portion of the capillary wick to dispense liquid to the top portion of the capillary  
4 wick.
- 1 5. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 the capillary wick is a layer of porous sintered material on a sheet of conducting material.
- 1 6. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,

2 a liquid line irrigator connects to the liquid line, the liquid line irrigator extends along the  
3 capillary wick, and a series of fluid dispensing openings in the liquid line irrigator distributes  
4 working fluid along the capillary wick.

1 7. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 the capillary wick is a first layer of porous sintered material on a first sheet of conducting  
3 material, and a second layer of porous sintered material on a second sheet of conducting  
4 material; and

5 a liquid line irrigator is connected to the liquid line, the liquid line irrigator has both, a  
6 first series of openings dispensing liquid phase working fluid on the first layer, and a second  
7 series of openings dispensing liquid phase working fluid on the second layer.

1 8. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 the capillary wick is a first layer of porous sintered material on a first sheet of conducting  
3 material, and a second layer of porous sintered material on a second sheet of conducting  
4 material; and

5 reinforcing rods between the first layer and the second layer define a vapor collection  
6 cavity therebetween; and the vapor collection cavity connects with the vapor line.

1 9. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 the capillary wick is a layer of porous sintered material on a sheet of conducting material;  
3 and  
4 reinforcing rods define a vapor collection cavity along the capillary wick.

1 10. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 the capillary wick is a layer of porous sintered material on a sheet of conducting material;  
3 and  
4 reinforcing rods extend across a surface of the capillary wick and define a vapor  
5 collection cavity along the surface.

1 11. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,

2           the vapor line connects to a first manifold having multiple outlets for connecting  
3   respective vapor lines of multiple evaporators;  
4           the liquid line connects to a second manifold having multiple outlets for connecting  
5   respective liquid line irrigators; and  
6           the respective liquid line irrigators distribute liquid to respective capillary wicks of the  
7   multiple evaporators.

1   12.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2           the vapor line connects to a first manifold having multiple outlets for connecting  
3   respective vapor lines of multiple evaporators;  
4           the liquid line connects to a second manifold having multiple outlets for connecting to  
5   respective liquid line irrigators for the multiple evaporators; and  
6           the multiple evaporators are interconnected along their bottoms to share a common liquid  
7   reservoir.

1   13.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2           reinforcing rods extend lengthwise across a surface of the capillary wick and define the  
3   vapor collection cavity, and prevent collapse of the capillary wick into the vapor collection  
4   cavity.

1   14.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2           the capillary wick is a layer of sintered conducting material on a sheet of conducting  
3   material; and  
4           reinforcing rods extend lengthwise across a surface of the capillary wick and define the  
5   vapor collection cavity, and prevent collapse of the capillary wick into the vapor collection  
6   cavity.

1   15.   The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2           the capillary wick is a layer of sintered conducting material on a sheet of conducting  
3   material;  
4           a liquid line irrigator is connected to the liquid line;  
5           the liquid line irrigator extends along a top portion of the capillary wick; and

6 a series of fluid distribution openings in the liquid line irrigator supplies liquid to the  
7 capillary wick. at least a pair of sheets (204) with at least one of the sheets (204) having a  
8 corresponding wick portion (200) attached thereto.

1 16. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,  
2 the capillary wick is a first layer of porous sintered material on a first sheet of conducting  
3 material, and a second layer of porous sintered material on a second sheet of conducting  
4 material;  
5 reinforcing rods between the first layer and the second layer define a vapor collection  
6 cavity therebetween; and the vapor collection cavity connects with the vapor line; and  
7 the reinforcing rods are secured to at least one porous backing layer.

1 17. A capillary assisted loop thermosiphon apparatus comprising:  
2 at least one evaporator connected by a vapor line to a condenser; a liquid line connecting  
3 the condenser and the evaporator; the evaporator is in the direction of gravity from the condenser  
4 such that the condenser supplies liquid under gravity induced pressure to the evaporator; and the  
5 evaporator has at least a pair of sheets, with at least one of the sheets having a corresponding  
6 wick portion attached thereto to provide a vertical capillary wick in which liquid wicks in the  
7 direction of gravity.

1 18. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,  
2 a vapor collection cavity extends vertically along the capillary wick, and the vapor  
3 collection cavity is connected to the vapor line.

1 19. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,  
2 a liquid line irrigator connected to the liquid line supplies liquid under gravity induced  
3 pressure to a vertical heat conducting section of the capillary wick;  
4 the capillary wick extends in conducting engagement along at least one heat absorbing  
5 surface on the evaporator; and  
6 a vapor collection cavity in the heat conducting section of the capillary wick extends  
7 vertically along the capillary wick, and the vapor collection cavity is connected to the vapor line.

1 20. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,

2 a liquid line irrigator is connected to the liquid line, and the liquid line irrigator extends  
3 along a top portion of the capillary wick to dispense liquid to the top portion of the capillary  
4 wick.